

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building - 517 Gold Avenue SW
Building No: NM0024ZZ
Location: Albuquerque, New Mexico

WORK ITEM: Action required within 5 years X Action required within 5-20 years ____

Number: 515.1A - HVAC

Title: Complete Air Handling System Upgrade.

Cost: FY 94: \$1,588,000 FY 98: \$2,160,000

DESCRIPTION:

The existing air handling systems for the building consists of two multi-zone air handling units per floor, from the first through the eighth floor. These units each have four zones which feed three exterior exposures of the building and one interior zone. These are all built-up air handling systems consisting of centrifugal fans on an inertia base, separate steam heating and chilled water cooling coils with multi-zone mixing dampers. Each air handler is also equipped with outside and return air dampers for economizer cycle and a roll filter for air filtration.

This work item consists of complete replacement of the existing sixteen multi-zone air handling units and four central station air handling units (basement) located within the building. The sixteen multi-zone units will be replaced with similar arrangement air handling units complete with centrifugal fans, and, chilled water cooling coils, economizer dampers, 30% efficiency banks, and variable speed drive inverters and new motors. The central station units located in the basement mechanical rooms will be replaced with similar equipment consisting of economizers, heating and cooling coils, filters and fans.

This item also includes complete removal of the existing multi-zone unit distribution ductwork system and replacement with a single-zone, single temperature, variable air volume system, including variable air volume terminal units with terminal reheat coils. Also included are all new supply air diffusers, return grilles, exhaust registers, etc., throughout the building.

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The new variable air volume systems will consist strictly of a cooling coil for a single temperature distribution within the building utilizing either chilled water or outside air through an economizer control. Heating for the building will rely on the existing or remodelled perimeter radiation system, or on upsized terminal reheat coils located in each of the variable air volume distribution boxes. Upsized reheat coils will add \$42,000 including mark-ups to the indicated FY94 upgrade cost, but such an addition will eliminate the need to upgrade the perimeter radiation system.

JUSTIFICATION:

The existing air handling units were installed in the building when it was built in 1960. The coils show some wear, the filters are an expensive maintenance problem, the hot deck of the multi-zone unit consists of a steam coil with a steam control valve which has difficulty maintaining a fixed hot deck temperature. The multi-zone units in themselves are non-energy conservative since the hot and cold deck work at the same time and then mix for zone temperature control. There are only four zones in each of the sixteen multi-zone units, or sixty-four zones of temperature control in the total building served by the multi-zone units. The new variable air volume system will be set up with six to eight zones per air handling unit and can be expanded to any number of zones necessary, based on the occupancy of the building and number of zones required. It will also provide for maximum of flexibility through relocation or installation of new VAV terminal units during tenant development.

ASSOCIATED WORK ITEMS:

Refer to Work Item 310.4 and 310.5 for Removal and Repair of Ceilings.
Refer to Work Item 471.1A and 471.1B for Fire Protection System.
Refer to Work Item 515.2A for Conversion of Heating System to Hot Water.
Refer to Work Item No. 515.1B and 515.1C for Optional Air Handling Modifications.
Refer to Work Item No. 515.3. for Replacement of Steam Radiation System.

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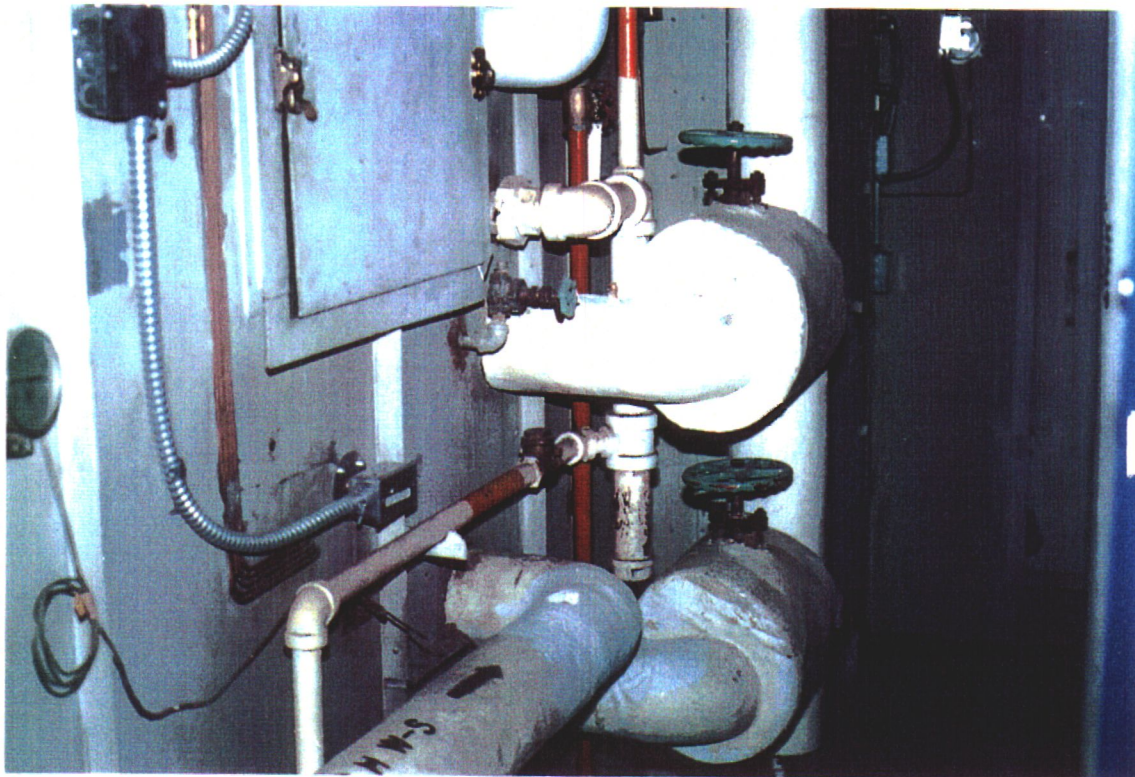
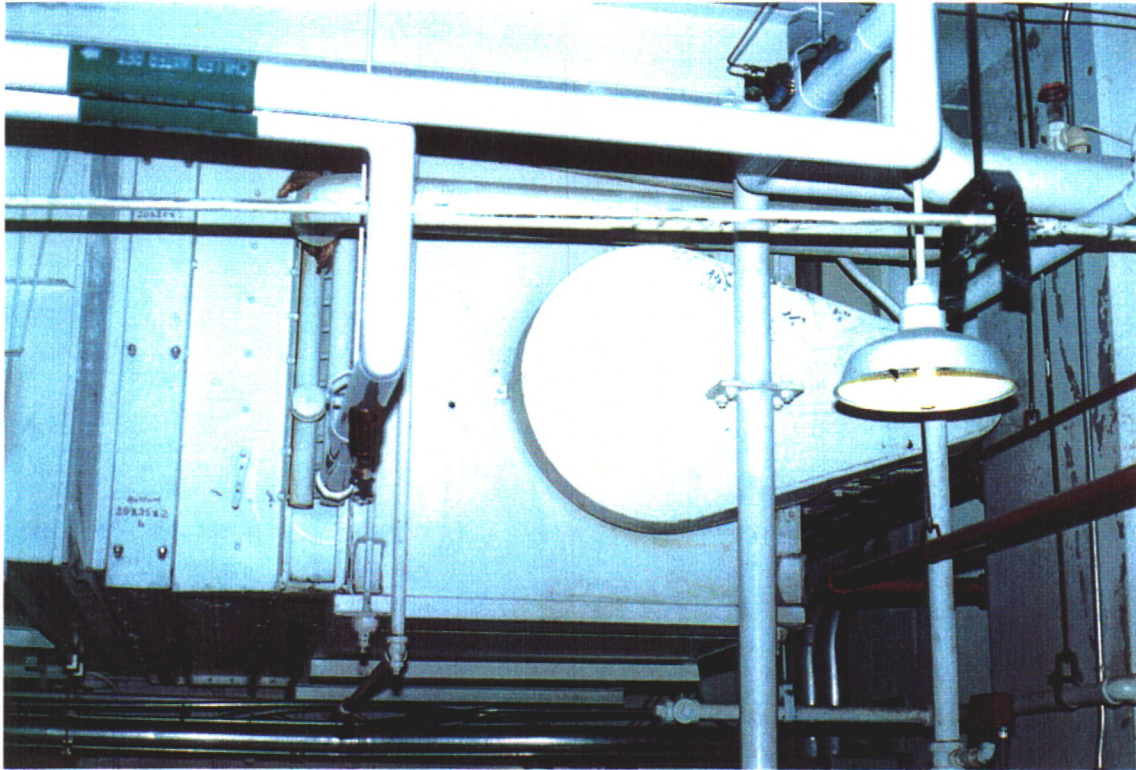
Albuquerque, New Mexico



Roll Filters

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BUILDING ENGINEERING REPORT (BER)

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 Location: Albuquerque, New Mexico

Number: 515.1A – HVAC System

Title: Complete Air Handling System Upgrade

DETAILED COST ESTIMATE

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Removal of Existing	1	LOT	\$326,881	\$326,881
Supply Fans – 36" Centrifugal	16	EA	\$2,500	\$40,000
Supply Fans – Inertia Bases	16	EA	\$800	\$12,800
Supply Fans – Motors	16	EA	\$550	\$8,800
Supply Fans – V–Belt Drives	16	EA	\$250	\$4,000
10 HP VFD (Inverter Drives)	16	EA	\$6,500	\$104,000
Filter Banks with 30% Filters	16	EA	\$400	\$6,400
Coil Housings	16	EA	\$450	\$7,200
Cooling Coils	16	EA	\$600	\$9,600
Control Valves	16	EA	\$250	\$4,000
Economizer Dampers	32	EA	\$150	\$4,800
Controls	16	EA	\$250	\$4,000
Fire Dampers (Equipment Room)	80	EA	\$60	\$4,800
Supply Duct High Presure	10000 (4,535.9)	LB (KG)	\$6	\$60,000
VAV Terminal (8/AHU)	128	EA	\$450	\$57,600
HW Coils	128	EA	\$125	\$16,000
Low Pressure Ductwork	25000 (11,339.8)	LB (KG)	\$4	\$100,000
Central Station AHU	6	EA	\$6,500	\$39,000
Diffusers	800	EA	\$45	\$36,000
Flex Duct	800	EA	\$28	\$22,400
Return Grilles	300	EA	\$40	\$12,000
Exhaust Registers	60	EA	\$36	\$2,160
Insulation of Ductwork	31250 (2,903.1)	SF (SM)	\$1	\$31,250
Chilled Water Piping 8" with Insulation	250 (76.2)	LF (M)	\$64	\$16,000
Chilled Water Piping 6" with Insulation	400 (121.9)	LF (M)	\$44	\$17,600
Chilled Water Piping 4" with Insulation	600 (182.9)	LF (M)	\$32	\$19,200
Chilled Water Piping 3" with Insulation	400 (121.9)	LF (M)	\$26	\$10,400

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Location: Albuquerque, New Mexico
Number: 515.1A – HVAC System
Title: Complete Air Handling System Upgrade

DETAILED COST ESTIMATE

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Hot Water Piping 4" with Insulation	600 (182.9)	LF (M)	\$31	\$18,600
Hot Water Piping 3" with Insulation	400 (121.9)	LF (M)	\$25	\$10,000
Hot Water Piping 2" with Insulation	600 (182.9)	LF (M)	\$16	\$9,600
Room Thermostats	128	EA	\$175	\$22,400
System Commissioning	1	EA	\$71,061	\$71,061
System Test and Balance	1	EA	\$35,531	\$35,531
Subtotal				\$1,144,082
Mark-Up – 15% Contingency				\$171,612
Mark-Up – 18% Overhead and Profit				\$205,935
N.M. Gross Receipts Tax at 5.8125%				\$66,500
Total E.C.C.				\$1,588,129
Total E.C.C. (rounded)				\$1,588,000

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building - 517 Gold Avenue SW
Building No: NM0024ZZ
Location: Albuquerque, New Mexico

WORK ITEM: Action required within 5 years X Action required within 5-20 years

Number: 515.1B - HVAC System

Title: Extended Practical Upgrade for the Air Handling Systems

Cost: FY 94: \$792,000 FY 98: \$1,079,000

DESCRIPTION:

Refer to Work Item 515.1A for description of existing system.

This work item includes all of the items included in Work Item No. 515.1C, in addition to replacement of all of the low pressure ductwork in the building. The new ductwork will be sized for additional air quantity, and will therefore require all new diffusers, return grilles, exhaust registers, etc.

JUSTIFICATION:

The existing system is inadequate to provide the air quantity necessary for an office operating in the 1990's. The interior heating loads from personal computers, copy machines, etc., is far above that designed for in the 1960 design for this building. Also, the equipment is near the end of it's useful life (35 years) and should be replaced with updated equipment that will last for an additional 20 years. The existing fans will be increased in RPM to handle the additional air quantity and the existing motors are oversized in order to allow for this contingency.

ASSOCIATED WORK ITEMS:

Refer to Work Item 310.4 and 310.5 for Ceiling Replacements.
Refer to Work Item No. 471.1A and 471.1B for Associated Fire Protection Items.
Refer to Work Item 515.1A and 515.1C for Optional Air Handling Modifications.

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building – 517 Gold Avenue SW

Building No.: NM0024ZZ

Location: Albuquerque, New Mexico

Number: 515.1B – HVAC System

Title: Extended Practical Upgrade for Air Handling Systems

DETAILED COST ESTIMATE

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Removal of Existing	1	LOT	\$163,098	\$163,098
Filter Banks with 30% Filters	16	EA	\$400	\$6,400
Coil Housings	16	EA	\$450	\$7,200
Cooling Coils	16	EA	\$600	\$9,600
Control Valves	16	EA	\$250	\$4,000
Economizer Dampers	32	EA	\$150	\$4,800
Controls	16	EA	\$250	\$4,000
Fire Dampers (Equipment Room)	80	EA	\$60	\$4,800
Low Pressure Ductwork	40000 (18,143.6)	LB (KG)	\$4	\$160,000
Diffusers	800	EA	\$45	\$36,000
Flex Duct	800	EA	\$28	\$22,400
Return Grilles	300	EA	\$40	\$12,000
Exhaust Registers	60	EA	\$36	\$2,160
Insulation of Ductwork	50000 (4,645.0)	SF (SM)	\$1	\$50,000
Chilled Water Piping 4"	400 (121.9)	LF (M)	\$32	\$12,800
Chilled Water Piping 3"	200 (61.0)	LF (M)	\$26	\$5,200
Hot Water Piping 3"	400 (121.9)	LF (M)	\$25	\$10,000
Hot Water Piping 2"	200 (61.0)	LF (M)	\$16	\$3,200
System Commissioning	1	EA	\$35,456	\$35,456
System Test and Balance	1	EA	\$17,728	\$17,728
Subtotal				\$570,842
Mark-Up – 15% Contingency				\$85,626
Mark-Up – 18% Overhead and Profit				\$102,751
N.M. Gross Receipts Tax at 5.8125%				\$33,180
Total E.C.C.				\$792,399
Total E.C.C. (rounded)				\$792,000

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WORK ITEM: Action required within 5 years X Action required within 5-20 years ____

Number: 515.1C - HVAC System

Title: Practical Air Handling Unit Upgrade
(New coils and valves, no new ductwork)

Cost: FY 94: \$180,000 FY 98: \$245,000

DESCRIPTION:

Refer to Work Item 515.1A for description of the existing system.

This work item consists of replacement of the coil section, coils, control valves, economizer dampers and filters on the existing air handler units. This would retain the existing supply fans and supply fan motor and drives. This work order also consists of installing fire dampers in the outside air intakes and the return air inlets to the mixing chamber of the unit and fire dampers on the supply air ducts leaving the room.

JUSTIFICATION:

This work item is justified due to the age of the air handling units (approximately 35 years). The heating and cooling coils and the sheet metal enclosure for them should be replaced to provide extended life for the system.

ASSOCIATED WORK ITEMS:

Refer to Work Item No. 515.1A and 515.1B for Optional Air Handling Modifications.

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building – 517 Gold Avenue SW
 Building No.: NM0024ZZ
 Location: Albuquerque, New Mexico

Number: 515.1C – HVAC System

Title: Practical Air Handling Unit Upgrade
 (New Coils and Valves, No Ductwork)

DETAILED COST ESTIMATE

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Removal of Existing	1	LOT	\$36,984	\$36,984
Filter Banks with 30% Filters	16	EA	\$400	\$6,400
Coil Housings	16	EA	\$450	\$7,200
Cooling Coils	16	EA	\$600	\$9,600
Control Valves	16	EA	\$250	\$4,000
Economizer Dampers	32	EA	\$150	\$4,800
Controls	16	EA	\$250	\$4,000
Fire Dampers (Equipment Room)	80	EA	\$60	\$4,800
Controls	1600	EA	\$4	\$6,400
Low Pressure Ductwork	2000 (907.2)	LB (KG)	\$1	\$2,000
Chilled Water Piping 4"	400 (37.2)	SF (SM)	\$32	\$12,800
Chilled Water Piping 3"	200 (61.0)	LF (M)	\$26	\$5,200
Hot Water Piping 3"	400 (121.9)	LF (M)	\$25	\$10,000
Hot Water Piping 2"	200 (61.0)	LF (M)	\$16	\$3,200
System Commissioning	1	EA	\$8,040	\$8,040
System Test and Balance	1	EA	\$4,020	\$4,020
Subtotal				\$129,444
Mark-Up – 15% Contingency				\$19,417
Mark-Up – 18% Overhead and Profit				\$23,300
N.M. Gross Receipts Tax at 5.8125%				\$7,524
Total E.C.C.				\$179,684
Total E.C.C. (rounded)				\$180,000